

Multifunctionality in mangrove ecosystems: the social network approach

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The relationship between biodiversity and ecosystem functioning (hereafter EF) has emerged as one of the central topics in current ecological research owing to the alarming rates of species loss. While the major proportion (72.96%) of EF studies has been carried out on terrestrial ecosystems, aquatic ecosystems including estuarine ecosystems like mangroves have received scant attention. The aim of this current research is to understand the EF of mangroves which are known for providing a host of ecosystem services. Mangroves merit urgent research attention since more than 35% of the world's mangroves have been lost in the past two decades alone. Using a novel approach of utilizing tools developed in Social Sciences (Social Network Analysis-SNA) we attempt to answer the following fundamental questions in mangrove ecology: i) Which functions are important in a mangrove? ii) Which species are more functional than others? iii) Are there keystone species in mangroves? We begin by defining which functional elements exist in a generic mangrove based on a meta-analysis of published literature. Then we use SNA to build a theoretical network of mangrove species and their functions. This research is perhaps the first systematic attempt to analyze the functionality of mangroves from a multi-functional perspective using tools outside the domain of ecological sciences. The outcomes of this study are also expected to serve as a guideline to policy makers and restoration ecologists working on mangroves worldwide.